


# FW: Messenger Article

Thursday, June 18, 2015 2:40 PM

Subject	<b>FW: Messenger Article</b>
From	Perkins, Eric
To	Perkins, Stephen
Cc	Voorhees, Jeanne
Sent	Monday, November 17, 2014 10:49 AM
Attachments	 Messenger Article ...

Hi Stephen,

This article on tile drainage ran in Saturday's St. Albans Messenger.  
Eric

**From:** Potter, Kip - NRCS, Colchester, VT [<mailto:Kip.Potter@vt.usda.gov>]  
**Sent:** Monday, November 17, 2014 10:32 AM  
**To:** Voorhees, Jeanne; Perkins, Eric  
**Subject:** Messenger Article

See attached. - Kip

Fletcher (Kip) Potter  
Water Quality Specialist  
USDA-NRCS  
356 Mountain View Drive, Suite 105  
Colchester, VT 05446  
(802)-951-6796 x238

This electronic message contains information generated by the USDA solely for the intended recipients. Any unauthorized interception of this message or the use or disclosure of the information it contains may violate the law and subject the violator to civil or criminal penalties. If you believe you have received this message in error, please notify the sender and delete the email immediately.

# the drainage: beneficial or u

## Recent findings give researchers cause for concern

By **MICHELLE MONROE**  
Messenger Staff Writer

**S**T. ALBANS — Just two short years ago, water quality groups and agronomists were advising farmers to install tile drainage in the belief it would help reduce runoff from fields into lakes and water-

ways and increase corn yields, a "win-win" in the words of water quality expert Julie Moore.

However, new research is casting doubt on the water quality benefits of a field drainage system that has been prevalent here for nearly half-a-century. Studies published last month found that half of the phosphorous runoff from fields in the Lake Erie watershed was coming from tile drainage. Another study, published last year, found that tile drainage contributes to erosion within streams themselves.

► See **DRAINAGE** on page 2A



# The furry side Love C purely

By **ELODIE REED**  
Messenger Staff Writer

**F**RANKLIN COUNTY election is over and results are in. Ever since vote tallies were determined on Nov. 4, the Messengers have been learning more about Franklin County's electorals -- the people who create Vermont's laws, judgments in the courts affect the state's and Franklin County's budgets -- really. This particular investigation, with exclusive re-



## LOCAL/VERMONT

### Drainage

continued from page 1

"We went into it thinking (tile drainage) was a great solution to overland erosion and now are realizing it comes with its own set of challenges," said Moore, a former state official charged with cleaning up Lake Champlain, who is now with the engineering firm, Stone Environmental.

It was believed that tile drainage would reduce runoff by carrying excess water away from fields, creating capacity for those fields to absorb water during the next rainstorm.

Tile drainage is good for corn, which does not do well in wet fields. Faster growing corn varieties uses more nutrients from the soil, including phosphorus and nitrogen, thus reducing the amount of phosphorus in the soil, pointed out Laura DiPietro, deputy director of Agriculture Resource Management with the Vermont Agency of Agriculture.

Phosphorus is known to feed blue-green algae blooms in freshwater lakes like Lake Champlain and Lake Erie. Those blooms can be toxic and this summer caused contamination in Lake Erie that required Toledo, Ohio to warn customers not to use the municipal water supply until the situation was resolved.

Tile drainage could still be part of the solution to reducing phosphorus runoff from agricultural fields, but research suggests it will need to be combined with the right field practices in the right place at the right time.

half of the phosphorus leaving the fields.

"They also found, contrary to previous research, that peak flow through the tile drainage was occurring within a minute or two of peak surface runoff. A lot of the flow we were getting through the tile was very rapid," said Doug Smith, ARS research scientist.

rous loss, with the rest coming from surface erosion. At the clay site, phosphorus levels in subsurface runoff were higher. In the second year of the study, an unusually dry summer the preceding year had led to the formation of macropores in the soil. That year, 63 percent of the phosphorus loss came from the field.

### We ... now are realizing it comes with a set of challenges.

Julie Moore, scientist & engineer

was in subsurface runoff. Overall, subsurface runoff accounted for an average of 40 percent of the phosphorus loss on the two sites over the five years of the study. However, phosphorus concentrations in surface runoff were more than 10 times that in the field.

The majority of the surface runoff was caused by cation winter cover crops, which would reduce that runoff, were in use. Smith and King have recommended farmers consider shallow tillage above the tilling in their fields to break up macropores. No tillage fields have become the norm in the Midwest.

DiPietro said one advantage of phosphorus correlation between the tile and the amount of phosphorus in the field. Their data show a direct correlation between the amount of phosphorus in the field and the amount of phosphorus in the tile.

The upper two inches of soil is driving what we see in the tile.

Doug Smith, ARS research scientist

# I report savings firms

ing, Vermont school districts provide excellent health insurance benefits to their employees — among the most generous health insurance benefits available to any Vermont employees in either the public or private sectors," writes in the KSE report. "A transition to a publicly funded health insurance system is likely to result in substantial savings ..."

On average in Vermont, school district employees pay 14 percent of their health care premiums, and districts pick up 86 percent. In Colchester, employees pay as much as or more toward their premiums — 20 percent — than any other school district in the state.

When Vermont Health Connect went live last year, all employers with 50 or fewer workers were mandated to purchase plans on the exchange. That was supposed to be slowly ratcheted up to eventually include all employers, continuing with employers of fewer than 100 workers this year. But debilitating glitches with the exchange forced even employers of

ing, Vermont school districts provide excellent health insurance benefits among the most generous available to any Vermont employees in either the public or private sectors," writes in the KSE report. "A transition to a publicly funded health insurance system is likely to result in substantial savings ..."

On average in Vermont, school district employees pay 14 percent of their health care premiums, and districts pick up 86 percent. In Colchester, employees pay as much as or more toward their premiums — 20 percent — than any other school district in the state.

When Vermont Health Connect went live last year, all employees with 50 or fewer workers were mandated to purchase plans on the exchange. That was supposed to be slowly resolved.

The drainage could still be part of the solution to reducing phosphorous runoff from agricultural fields, but research suggests it will need to be combined with the right place at the right time.

Research conducted in the Lake Erie basin by scientists from the Agricultural Research Service (ARS) found that tile drainage accounted for



## Phosphorous Funneling

in the top two inches of the soil is driving what we see in the tile," said Smith. On nearly all of the fields they studied the phosphorous was applied through chemical fertilizers rather than manure as is typical here. What impact that difference in application may have is unknown.

However, previous research in the Missisquoi Basin did find that clay soils with macropores had more phosphorous in the water coming out of the tile than sandier soils.

## We ... now are realizing it cost of challenges.

Julie Moore, scientist & engineer

Now assigned to the federal ARS office in Texas and one of the scientists leading the research.

Previous research had found it would take hours or days for water to infiltrate from the surface to the buried tiles, explained Smith. But that research was done in sandy soils, not the clay-loam soils of the Lake Erie basin.

Smith and fellow researcher Kevin King believe macropores, cracks in the soil that act as funnels transporting water and nutrients downward, may explain both the rapidity with which water reached the tile and the amount of phosphorous in the tile.

Their data show a direct correlation between the amount of phosphorous and the tile drainage fields have become the norm in the Midwest.

DIPietro said one advantage of soil is driving what we see in the tile.

Doug Smith, ARS researcher on study

findings

"The upper two inches of soil is driving what we see in the tile," said Smith. On nearly all of the fields they studied the phosphorous was applied through chemical fertilizers rather than manure as is typical here. What impact that difference in application may have is unknown.

However, previous research in the Missisquoi Basin did find that clay soils with macropores had more phosphorous in the water coming out of the tile than sandier soils.

She supports research into treating the subsurface runoff coming out of the tiles in order to remove phosphorous before the water reaches rivers and streams.

Tile drainage has been being installed in Vermont for more than 50 years, she said. The exact amount of tile drainage already in the Lake Champlain basin or Franklin County is impossible to determine.

## Treating runoff